

REMARKS

Claims 1-4 are presently pending in the application.

Claim 1 has been amended to positively recite that the first and second polymer electrolytes each comprise polymer electrolyte particles. Support for this amendment may be found in the specification at least at page 9, lines 4-6. Further, the subject matter of claim 1 has been incorporated into claims 3 and 4. No new matter has been added by these amendments, and entry is respectfully requested.

At the outset, Applicants acknowledge and appreciate the time and consideration afforded to Applicants' undersigned representative during a telephone interview on June 15, 2006. During this interview, the Examiner acknowledged that amending claim 1 to positively recite the particle sizes of the first and second polymer electrolytes particles would help to distinguish the claims over the prior art of record since this amendment would change the emphasis and meaning of the claim. As explained in more detail below, the Examiner also acknowledged that the prior art does not teach or suggest two different polymer electrolytes which comprise electrolyte particles which are different in size. The distinctions between the presently claimed invention and the prior art are set forth in more detail below.

Applicants appreciate the Examiner's indication in the present Office Action that claims 3 and 4 are only objected to as being dependent upon a rejected base claim but would be allowable if rewritten in independent form. In view of the present amendment to incorporate the subject matter from independent claim 1 into claims 3 and 4, it is respectfully submitted that these claims are allowable and withdrawal of the objection is respectfully requested.

The Examiner has maintained the rejection of claims 1 and 2 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,728,485. (It is noted that at the top of page 3 of the Office Action, the Examiner states that the claims have also been rejected under 35 U.S.C. § 103(a), but then notes that the § 103(a) portion of the prior rejection is not applied toward the present claims.) In support of the anticipation rejection, the Examiner argues that, in addition to the

reasons set forth previously, Watanabe teaches first and second particle sizes as claimed. Further, the Examiner contends that:

As to the first and second particle sizes of the first and second hydrogen conductive polymer electrolytes [being] different, it is maintained that the size of the solid polymer electrolyte which coats these particles would resultantly and inherently be different in size by virtue of the first particle being a substantially spherical particle and the second particle having a lengthwise dimension...By "different in size," the Examiner maintains that Watanabe et al. teaches this feature to the extent that the first and second particles are clearly different in shape and hence resultantly different in size.

Applicants respectfully traverse this rejection for the reasons set forth previously on the record, which Applicants rely upon in full, and for the additional reasons which follow, and respectfully request reconsideration and withdrawal of the rejection.

The presently claimed invention is directed to a polymer electrolyte fuel cell containing a catalyst layer comprising two types of carbon particles (which may be the same or different) supporting a noble metal catalyst. The first carbon particles adsorb a first hydrogen ion conductive polymer electrolyte which comprises first polymer electrolyte particles, and the second carbon particles adsorb a second hydrogen ion conductive polymer electrolyte which comprises second polymer electrolyte particles. Importantly, the sizes of the first and second polymer electrolyte particles are different.

Example 7 of the present application describes adjusting the particle sizes of the polymer electrolytes which are to be adsorbed to carbon particles. The sizes may be adjusted by varying the concentration of polymer electrolyte in ethanol dispersion and/or by adjusting the second solvent which is added to the dispersion, which varies the dielectric constant of the mixed solvent (see pages 21-22 of the application). As shown in Table 1 of Example 7, a series of polymer electrolytes were prepared and the particles sizes thereof measured. Electrolyte particle sizes from 32 to 300 nm were observed. It is emphasized that these are the sizes of the polymer electrolyte particles and do not relate to the size of the electrolyte which has been or will be adsorbed onto carbon particles.

As shown further in Figs. 4 and 6, increasing the concentration of polymer electrolyte in solvent changes the particle size of the electrolyte from relatively small (30 nm, Figs. 4(a) and

6(a)) to relatively large (200 nm (Figs. 4(b) and 6(b))). Once again, these differing sizes are of the polymer electrolyte particles themselves, irrespective of the size of the carbon particles to which they may be adsorbed.

In contrast, Watanabe teaches two different shapes of carbon particles, particles which are spherical and particles which are fibers, both of which are coated with a polymer electrolyte. The Examiner takes the position that since the carbon particles themselves have different sizes, the electrolytes which coat them would resultantly be different in size. However, this conclusion is not relevant to the presently claimed invention, in which the polymer electrolyte particles themselves are different in size.

In contrast with the presently claimed invention, Watanabe only teaches one polymer electrolyte, and does not teach or suggest the claimed “first and second” polymer electrolytes. Further, Watanabe is completely silent as to any particulate nature of the polymer electrolyte and does not teach or suggest that the electrolyte which is used to coat the spherical and fiber carbon particles has a specific particle size. Therefore, Watanabe certainly does not teach or suggest that the particles sizes of electrolytes which are used to coat the spherical and fiber carbon particles are different from one another as claimed. Accordingly, Watanabe does not teach or suggest all of the claimed elements, and reconsideration and withdrawal of the § 102(b) rejection are respectfully requested.

In view of the preceding Amendments and Remarks, it is respectfully submitted that the pending claims are patentably distinct from the prior art of record and in condition for allowance. A Notice of Allowance is respectfully requested.

Application No. 10/089,814
Reply to Office Action of March 20, 2006

Respectfully submitted,

IWAO ANZAI et al.

June 20, 2006 By: 
(Date)

SANDRA M. KATZ

Registration No. 51,864

AKIN GUMP STRAUSS HAUER & FELD LLP

One Commerce Square

2005 Market Street, Suite 2200

Philadelphia, PA 19103-7013

Telephone: 215-965-1200

Direct Dial: 215-965-1344

Facsimile: 215-965-1210

E-Mail: skatz@akingump.com

SMK/rc